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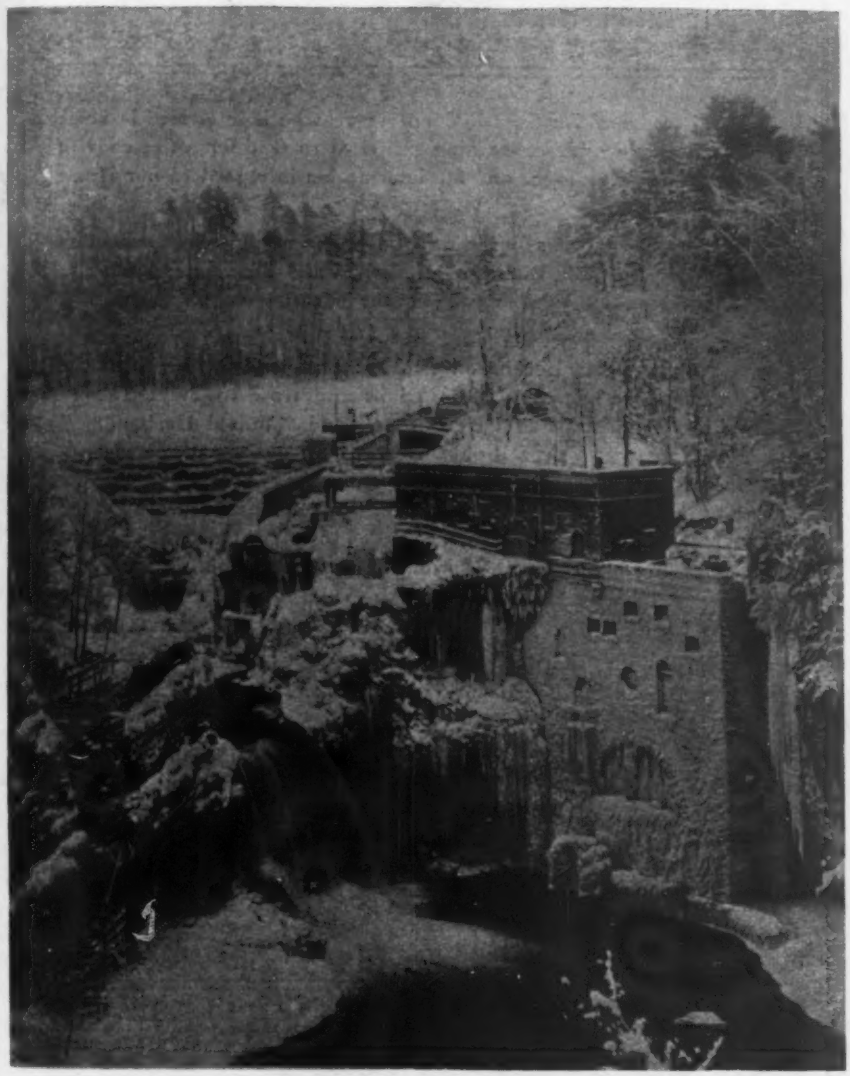
The Cornell Countryman



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The Home Correspondence School

Springfield, Massachusetts

DEPT. 21

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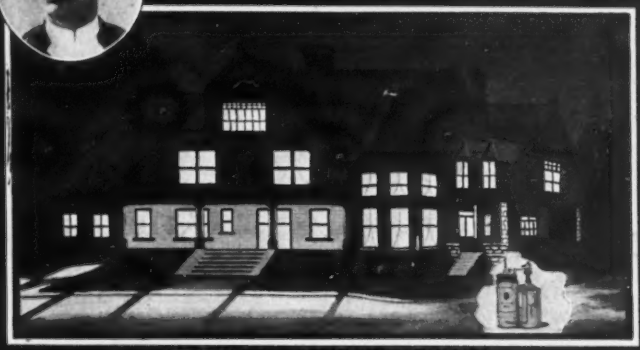

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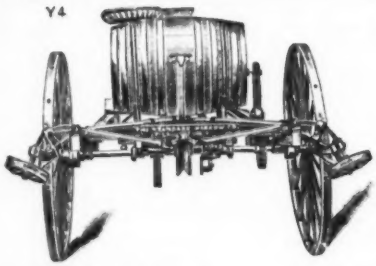

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WARSAW, N. Y., November 7, 1905

GENTLEMEN:—In answer to your communication of recent date as to my experience in spraying for the purpose of destroying wild mustard, I take pleasure in giving you the benefit of my experience.

I purchased one of the Standard Sprayers last spring through M. A. Richards of Warsaw. My farm is situated at Gainesville, in this County, and for many years has been covered with wild mustard, which showed itself in great profusion in every spring crop, retarding the growth of the grain and sapping the soil to such an extent that I was unable to secure more than half a crop. I learned through the report of the State Experiment Stations that wild mustard could be killed by spraying. I had not much faith in the remedy, but concluded it was worth the experiment. I had eight acres of barley which was sown rather late, and as I was late in giving my order for the Sprayer, when it came the grain was about six to eight inches high and the mustard was in blossom.

I concluded to try the experiment on one acre and watch the result. I mixed one barrel of the solution composed of eight pounds of blue vitrol to forty gallons of water and applied it. When mixed ready for use the solution made forty-five gallons. The second day after the spraying the mustard was practically all withered and dead, but the leaves of the grain turned red and resembled a field of grain that was badly "rusted." Nearly everyone who saw it said: "You have killed the mustard, but you have killed the grain as well," and I thought so myself. Within two weeks the grain that had been sprayed improved so that it was the most thrifty portion of the field, and the improvement was plainly discernable up to the time of harvest, when we found that in that portion of the field no mustard had gone to seed, and the grain was easily 50 per cent. better than on the balance of the field. I have no hesitation in saying that this treatment will eradicate wild mustard from the land without material injury to the grain crop, but I believe that better results can be obtained by earlier application and reducing the strength of the solution to about six pounds of vitrol to forty gallons of water. This is the formula I will use next season, and I shall use it upon every acre of grain I sow.

Very truly yours,

FRANK W. BROWN.

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Photo by Whetzel

PONDEROSA SPRAYED THROUGHOUT THE SEASON, WITH GREEN FOLIAGE ENTIRELY TO THE GROUND

THE CORNELL COUNTRYMAN

VOL. 3. JANUARY, 1906 NO. 4

A FUNGUS LEAF BLIGHT OF TOMATOES

By H. H. Whetzel,

Plant Pathologist at Cornell University Experiment Station

NEARLY every season tomatoes suffer more or less from attacks of certain fungus diseases upon the foliage. Several species of fungi are known to cause such injury. Some are, however, more disastrous in their effects than others. A very common one on the tomatoes in this state is a "leaf spot" fungus known botanically as *Septoria lycopersici Speg.* The writer has observed this disease for several seasons in the gardens about Ithaca. It appeared on his own tomatoes in the summer of 1904. Although the season was quite well advanced the loss was considerable. The plants had been set late and little fruit ripened before the middle of August. The blight spread rapidly and many of the vines were stripped of their foliage. The following season it was decided to test the value of Bordeaux Mixture in controlling the disease. Some studies of the fungus were also planned. Only a brief sketch of the summer's work is here presented. A bulletin on the subject will soon be issued from the Cornell Experiment Station giving a more detailed statement of the work.

This disease, like the tomato itself, undoubtedly came first from South America. It was there that the fungus was first observed and described by Speggazzini. It was not observed in this country until about 1894. In that year Dr. B. D. Halstead of the New Jersey Experiment Station first reported it as doing serious injury to tomatoes. It appeared suddenly and with considerable virulence about the same time in different truck growing sections of the East. Since then it has been frequently reported as serious in various states and even in certain countries of the Old World, especially Australia. At the New Jersey, Ohio and Delaware Stations quite a bit of work has been done in spraying for this disease, but not with uniformly favorable results.

The fungus appears first on the tip leaflets of the lower leaves, soon, however, infesting the entire leaf, causing it to die and dry up on the vine. (Fig. 1.) In the meantime the leaves above have become infected and unless immediate measures are taken for checking the progress of the fungus, the entire plant will be defoliated, and killed. This spread of the disease from below upwards is very characteristic. The parasite causes distinct spots in the leaf tissue (Fig. 2) which lose the green color and dry down leaving small gray papery areas of various sizes and shapes. Where the attack is severe these spots become confluent, often involving the entire leaf. These areas differ from other leaf spots of the tomato by the appearance on the lower surface of numerous little black pimples or pustules (Fig. 2) the fruit bodies of the fungus. These fruit bodies, known as *pycnidia*, are filled with spores, slender hyaline thread-like bodies with several cross walls. When mature they ooze from an opening in the tip of the pycnidium and are blown by the wind to the healthy leaves above and to other plants nearby. Here they germinate sending out a little thread, the mycelium, that enters the leaf. This quickly branches in all directions, killing the leaf cells and causing the characteristic spots. Each spot results from the growth of a single spore. Fruit bodies soon appear filled with spores and these are now disseminated to healthy leaves. The en-

FIG. 1—KILLED BY THE LEAF BLIGHT

tire cycle from spore to spore is completed in a very short time so that the devastation wrought by the parasite, is under favorable conditions, very rapid. The fruit bodies are frequently arranged in concentric circles owing to the radical growth of the mycelium from the point of infection.

The fungus often attacks the stem as well as the leaves, giving them a mottled appearance especially on the upper surface where the falling spores readily find lodgment. The fruit has never been observed to have been attacked. The explanation of this is not easy.

The first effect of the disease is to cause a more or less complete destruction of the foliage. Since the leaves are the active work-shops of the plant, manufacturing the food upon which the growth of all the parts depend, their entire loss means the death of the plant. If the attack comes early in the season, the fruit that has set fails to mature, and the entire plant soon succumbs. Late attacks destroy the leaves and expose the green fruits to the sun. Deprived of their normal food supply, they cease to grow and ripen prematurely. Such fruit is of small size and poor quality, lacking the rich flavor and firmness of fruits which ripen normally. A light attack resulting only in the death of a few lower leaves, may not seriously affect the crop. Such attacks, however are extremely dangerous as they quickly become destructive upon the appearance of favorable weather.

In the case of many parasitic fungi it has been observed, that certain varieties of the host plant are more susceptible to the disease than others. Although no special effort was made to test this in the case of the Septoria disease, some indications of a tendency along this line were observed. In the writer's garden this past season were five varieties of tomatoes: two varieties, names unknown, Stone, Ponderosa and the little yellow plum tomato used for preserving. One of the unknown varieties, the Ponderosa, and the yellow plum tomatoes were especially susceptible to the fungus. The other varieties were quite resistant. It was also noticed that the varieties most affected were apparently those with the least foliage, i. e., in which the leaflets were narrow and far apart on the leaf axis. Those with broad leaflets forming a dense growth of foliage seemed to be much more resistant.

In many cases the disease originates in the seed beds, the lower leaves of the young plants often showing the

FIG 2.—THE DEAD SPOTS ON A LEAF SHOWING THE FUNGUS FRUIT BODIES

disease when transplanted in the field. Frequently, too, plants become infected after they are set out. This is likely to be the case when the tomatoes are set in the same garden year after year. The old diseased tops left on the ground from the past season's crop, serve as a source of infection, the following year. Dr. Halstead has clearly demonstrated, that planting tomatoes on the same soil year after year results in the increase of the fungus on each succeeding crop.

The season of 1905 seems to have been a very favorable one in this section for the development of the leaf spot fungus. Few gardens about Ithaca escaped its ravages. The writer began spraying his plants about a month after they were set and continued throughout the season. Notwithstanding this, however, the disease appeared to a considerable extent on the lower leaves of nearly all the plants. Only on the more susceptible varieties, however, were the lower leaves entirely killed. The disease had appeared sometime before spraying was begun. In fact, some of the plants were diseased when transplanted. During the earlier part of the season all diseased leaves were removed and destroyed about twice a week. This alone did much to reduce the abundance of the disease. The plants were THOROUGHLY sprayed with Normal Bordeaux Mixture to which an excess of lime was added. This extra lime caused the mixture to stick better. The application was made about once every ten days or two weeks depending largely upon the weather. The leaves were covered on both sides, and stems and fruits were also coated. (Fig. 3.) *Thoroughness* is the key to success in spraying for this as well as any other fungus disease. The spraying of the fruit with Bordeaux is undesirable where tomatoes are grown for commercial purposes but for home use this is of little consequence as it is quite easily rubbed off. The application of Ammoniacal Copper Carbonate might be substituted for the Bordeaux when the fruit approaches maturity.

The results of this treatment were most satisfactory. The plants were staked so that thorough work could be done. While the tomatoes in adjoining gardens died early from attacks of this blight and ripened little fruit, the writers crop was heavy and of the finest quality, the foliage remaining green and healthy until frost came. (Frontispiece.) The apparatus used in spraying consisted of two wooden candy pails and a good foot pump with a short hose and a nozzle

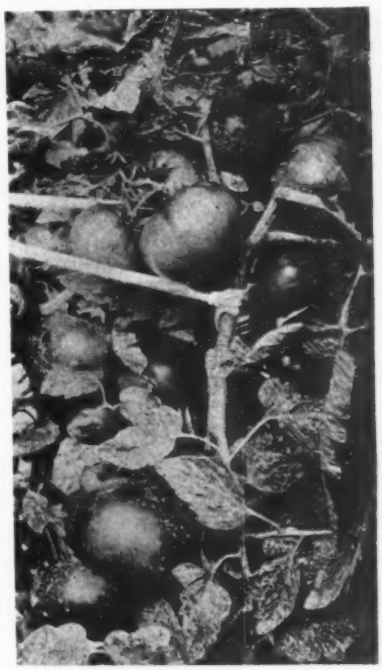
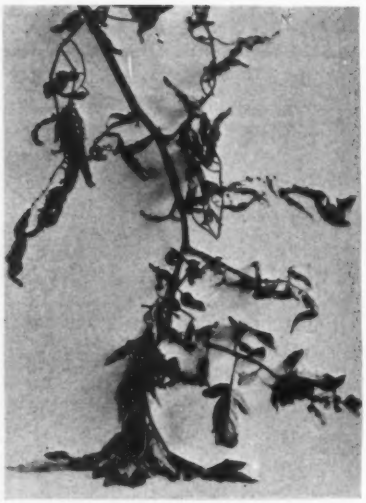


FIG. 3—PERFECT FOLIAGE, AND PERFECT FRUIT,—THE RESULT OF SPRAYING

giving a fine spray. The work was done evenings, after the regular work of the day. The time and labor required to entirely control this trouble in the home garden is very small and will be well repaid by the yield of large and fine flavored fruits. To be thoroughly successful, spraying should be begun in the seed beds, and continued throughout the season. Much may be done to hold the disease in check by removing diseased leaves as soon as they appear.



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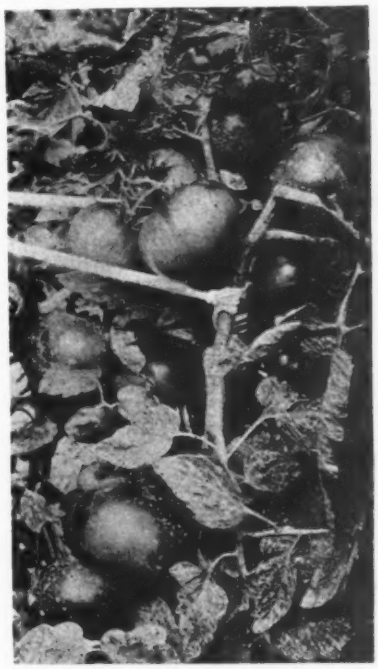

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THE MANUFACTURE OF CONDENSED MILK

By O. F. Hunziker.

HISTORICAL SKETCH

WHILE the recognition of the value of milk as a food and the knowledge of the principles of the manufacture of butter and cheese date back to the mystic ages, condensed milk is the child of the industrial evolutions of the nineteenth century. The first condensed milk was manufactured in this country by Gale Borden in 1856. In Europe George H. Page, an American, was the pioneer in the condensed milk business, erecting a factory in Switzerland in 1867. The early factories were equipped with very primitive machinery, the methods used were little more than an experiment, and the output was very small. The start was naturally slow, and in this country the first factory was not a success. Gradually, however, with the improvement of the machinery and a better understanding of the principles involved in the process of its manufacture, the quality of the finished product was perfected and found favor on the market. The industry progressed and developed into a business of tremendous dimensions. Today, the milk from not less than half a million cows is manufactured into condensed milk.

In the early days of the industry, sweetened condensed milk was the only form made. Later other forms were added, which reached the market under the names of "Unsweetened Condensed Milk," also called "Plain Bulk-Milk," "Evaporated Cream" and "Milk Powder."

Sweetened Condensed Milk is milk from which a portion of the water has been evaporated, and to which enough granulated cane sugar has been added to preserve it. It is put on the market in tin cans holding from 8 oz. to 20 oz., 16-ounce cans being the most common size used. In barrels, it is sold in bulk to candy or caramel manufacturers. Sweetened condensed milk, if manufactured and packed properly, will keep for years, though it is best when fresh.

Unsweetened Condensed Milk generally called "Plain Bulk Milk," is milk from which a portion of the water has been evaporated and which has subsequently been swelled by the introduction of free steam. This milk is sold in ordinary milk or cream bottles, or milk cans. It is not sterile and containing no sugar to preserve it, will keep only from 8 to 10 days.

Evaporated Cream is an unsweetened condensed milk. It has all the outward characteristics of cream, resembling the latter in odor, consistency and richness of taste. It is made by evaporating a small portion of the water of the crude milk, and putting the partly condensed article into tin cans varying in size from 8 ounces to one gallon. The filled cans are hermetically sealed, then sterilized at a temperature that will destroy all germ life, including spores of the most resistant types. The degree of the temperature and the duration of the exposure of the cans to it are so regulated as to not only destroy all germ life, but also to give the contents of the cans a creamy color and consistency. Evaporated Cream will keep indefinitely.

Milk Powders.

In the manufacture of Milk Powders the milk is evaporated to dryness in vacuo or the solids are separated from the water by a centrifugal process. Generally, cane sugar is added and either whole milk or skim milk is used. The processes employed in the manufacture of milk powders today do not, as yet, yield an entirely satisfactory product.

The output of sweetened condensed milk exceeds in quantity that of all the other forms of condensed milk combined. This fact, together with the limited space assigned to this subject in a paper serving the many important and diversified interests of rural science, as does *The Cornell Countryman*, compels the writer to restrict his dis-

cussion alone to the subject of *sweetened* condensed milk.

I. Essential factors to be considered when choosing a site for a Condensory.

When choosing a site for a Milk Condensory there are certain elements, factors and fundamental conditions which must be considered. Their presence or absence will largely determine the desirability of any given locality, while the ignorance of these factors will tend to curtail the success of the factory and may ultimately result in a total failure. The most important of these conditions are:—

A. The supply of crude milk.

B. The supply and quality of water.

C. The facilities for transportation.

D. The topography of the territory in question.

E. The altitude.

A. THE SUPPLY OF CRUDE MILK.

The first consideration, when selecting a site for a Condensory, is the milk supply. The territory in question must be adapted for the production of milk, it must be a Dairy Country. The factory should be erected in a locality which will, within a radius of not more than 10 miles, yield a sufficient supply of milk to run the factory at full capacity. It must be remembered that the cost of the equipment of a factory with a capacity of *less* than 25,000 lbs. of milk daily, is usually out of proportion to the gross returns of the business.

In connection with a survey of the milk supply in any given locality the demand for crude milk for other purposes must not be ignored. The presence of creameries and cheese factories need not be considered very seriously in the light of competition. The condensory is generally in a position to pay higher prices for milk. They also announce their prices from six to twelve months in advance so that their patrons know just what to expect. Again, the condensories pay their patrons oftener (monthly or bi-monthly) and with more regularity. The creameries and the cheese factories pay their patrons according to the quotations of the market of their respective products, the returns depending also on the skill of the operator in turning out a high quality of goods. Besides their pay days are irregular and usually far apart. The presence of creameries or cheese factories is rather a point in favor of a condensory site, indicating a large supply of available milk.

A different problem arises where the territory in question is in close proximity to a large industrial center, or where the transportation facilities to a city are very favorable. Where this is the case the continuous and great demand of crude milk for the city may result in sharp competition, limiting the supply of milk available for the condensory and raising the price of the same to abnormal proportions.

B. THE WATER SUPPLY.

Next in importance stands the water supply. The value of a generous supply of clean and cool water cannot be overestimated in connection with the manufacture of condensed milk. Besides the water used in the boiler for washing purposes, large amounts of water are necessary for condensing and cooling the milk.

Owing to the need of a large water supply, condensed milk factories are usually erected along creeks or rivers, from which they may pump the necessary water and which will also take care of their refuse. Other localities are fortunate enough to be supplied with water from springs and artesian wells, while in still others it is necessary to drill wells, shallow or deep from which the necessary water supply can be secured.

The creek or river water may be cool and fairly clean and may, therefore, serve the purpose very well. Condensories whose sole source of water is a stream, are known to have manufactured first class condensed milk for years.

On the other hand, the creek, river or stream may follow through one or more villages or towns above the con-

densory, and its shores may be bordered by other factories; when it reaches the condensory the water may be so polluted that it would be entirely unfit for use. In spite of all precautions the water used in the condensory is bound to come in contact with the milk directly or indirectly. Even where all the utensils and apparatus, after being washed, are conscientiously steamed, and while no harm need be feared from that source, there are still many channels through which the milk may become contaminated with the polluted water. It sometimes happens that during the process of condensing, the vacuum pump accidentally stops. If the manager does not notice this at once and if he fails to immediately close the valve of the water pipe leading to the condenser, varying amounts of water will run from the condensor into the milk in the vacuum pan. Where this water is filthy, it means the loss of an entire batch (say 15,000 lbs. of milk besides 2,400 lbs. of sugar.) Again, the pan may be rinsed between batches and the polluted water used will pollute the water of the succeeding batch. Or, when the cooling cans filled with condensed milk are set into the cooling tanks, frequently water splashes from the tank into the cans. So here again there is great danger of contamination. Finally, all the pipes conveying the milk from the receiving room to the vat-room, from there to the well-room and from the well-room into the pan, are repeatedly flushed with water.

The following observations made by the writer may serve to illustrate to what extent creek water may be polluted: A few years ago one of the milk condensories in this state made defective condensed milk, which was returned from the market in large quantities, causing great loss. An investigation of the source of water used in the factory revealed the following facts:

The factory obtained all its water from a creek which it bordered. Not more than 50 rods above the factory stood a slaughter house right on the edge of the water. The shore was literally strewn with hogs' and calves' heads, and in the creek rose a pile, about eight feet high, of slaughter-house refuse, which was in an advanced state of decomposition, polluting the water of the creek and the surrounding atmosphere to an extent that kept occasional visitors at a safe distance. From there down the stream, the water, charged with rotten organic matter, had covered the bottom of the creek with a brownish-red, slimy, malodorous deposit. This water was used in the condensory for cleaning purposes; with this water the cooling cans were rinsed and used again without steaming; this water poured forth from the spray pipe of the condensor, a few feet from where the milk was being cooked in vacuo; this water, together with the milk that was carelessly sucked over into the condensor formed a thick spongy coating on the inside of the walls of the condensor; this same water so infected this spongy crust with Bacillus floureseeus liquefacieus, that the odor inside of the condensor, from the activity of the above and other putrefactive organisms, the usual inhabitants of polluted water, forbade men with the most robust constitutions to stay in the condensor for more than an instant.

Is it to be wondered that some of the condensed milk from that factory was not relished by the consumer and that carloads of the same were rejected and returned to the manufacturer. The astonishing part of it all was not that some of the milk turned bad, but that any of it remained good.

Where it is necessary to drill wells, the territory should be carefully surveyed by an expert, in order to determine the formation of the strata, care being taken that in the place finally selected, the well won't serve as a cesspool for the surface water, nor for the drainage from manure-piles, refuse, and slaughter houses, and cemeteries. Generally speaking the deeper the well the less the danger from pollution, the purer the water, and the more constant its supply.

(To be continued.)

SOME RELATIONS OF CHEMISTRY TO AGRICULTURE

By George W. Cavanaugh,

Professor of Chemistry in its Relation to Agriculture at Cornell University

THE popular conception of the relation of chemistry to agriculture is much the same as that of medicine to the health of man. The physician diagnoses the disease and prescribes the remedy and treatment. The chemist can analyze the soil; but here the analogy ceases, he can not from the data derived from the analysis, prescribe the fertilizer nor make recommendations in soil management. There are too many other factors entering the problem of soils, which are equally important with the soil's composition to make it possible to correctly prescribe from analytical data alone.

That the opposite of the above should be the generally accepted idea is not strange. Many of the early investigators and writers devoted much time in trying to bring this problem down to a working basis, and their efforts are often given largely to descriptions of methods of analyzing soils. Then, too, it was the goal most sought for. If the question of a soil's fertility could be decided once for all by an expert it would relieve the owner of much worry and trouble.

This idea is, however, already beginning to change. Not so many men actually engaged in agriculture are now asking to have soils analyzed. It is significant, however, that many requests still come from people who are settling on farms for the first time after a life spent in the city.

The American farmer is fast reaching the state where he no longer asks to have the fertilizers prescribed for him but only that the chemist guarantees the quality of those of his own choosing.

Analysis of soils constitutes but a minor part of the work of an agricultural chemist, perhaps in general the least part. The examination of materials to be used in agriculture and of agricultural products probably constitute his principal work.

Here are two distinct lines of endeavor. On the one hand is the control of the quality of products offered on the market. This field is productive of results that have immediate value. On the other hand is the whole range of plant breeding by chemical selection. The work in this line has only begun, but the results so far obtained indicate that, in time, they will be far reaching. The effective control of the market for many agricultural products depends on the ability of the chemist to detect adulterations and substitutes. The manufacturer of oleomargarine can so skillfully blend colors, flavors and imitate the texture of genuine butter that the ordinary consumers can be easily deceived. There are, however, differences not apparent to the eye by which the chemist can readily detect the one from the other. For a time the so-called "process butter" threatened to invade the market of genuine butter. The similarity between them is greater and in consequence it is harder to detect. Recent investigations by the agricultural chemists have now made it possible to readily discover the adulteration. If these distinctions could not be easily made, the manufacturer would soon have the butter maker at his mercy.

Many of our Eastern dairymen must buy grain and concentrated feeds to supplement the feed grown on the farm. The Western miller has large quantities of by-products, of which the most notorious are corn cobs, oat hulls and corn bran. These are all low in nitrogen and consequently in protein content. The laws of most States have the sale of feeds under control. A chemist named Kjeldahl devised a means of determining the nitrogen content of an organic substance in a few hours. It had previously been a long and difficult process. His method is now used daily in the analyses of hundreds of feeds. It

is, however, in the field of plant breeding by chemical selection that one finds evidences of some of the most striking relations of chemistry to agriculture. This line of activity is of comparatively recent date notwithstanding the marked success of an earlier effort. We have for some time recognized the rise and development of the sugar beet from the ordinary garden beet. The increase in sugar content was possible because it was found that the beet root would still produce seeds after a portion of the root was removed. The portion removed was used to make an analysis for the sugar content. It was therefore easy to perpetuate only those with a higher sugar content. This process is still continued each year, in order to maintain the standard high. More recently successful efforts have been made in other lines. Whenever individuals of a crop vary in some easily distinguishable character, differences in future crops are possible. When the differences are of such a character that chemical analysis is required in the selection the chemist finds a fruitful field of work. Already one company, that grows seed corn, is maintaining a fully equipped chemical laboratory. It has been found practical to select corn that it may have a higher protein content for the cattle feeder, or a higher starch content for the starch maker. The desirable cooking qualities of the potato are being studied in their relation to the composition, and a beginning has been made in raising the sugar content of sweet corn.

While little effort is now being made to examine soils and to prescribe treatment for them, it must not be supposed that the chemistry of soils is being neglected. There is probably no other line of investigation that is receiving more attention. The old type of soil examination, where the gross amounts of plant food constituents were determined, is being superceded by more rational methods. Now the soil is examined for its degree of acidity or alkilinity, the character of its humus, and even the nature and strength of its soil solution. Instead of trying to find the amount of potash the soil contains, more attention is given to the conditions which influence the bacterial life of the soil, especially the nitrifying bacteria. This is more in accord with rational management. When the work now under way shall have progressed farther, we may confidently expect a more intimate and practical relation between the chemistry of the soil and its management.

POTATO GROWING

By F. A. Salisbury.

POTATO growing is entitled to a great deal of attention in this state, as New York leads all the other states in the production of tubers. The industry has undergone a great many changes in recent years and still offers a large field for development. When we think that the average yield in this state is less than ninety bushels per acre and that three hundred or more bushels can be grown, we begin to realize that there is still opportunity for development in the industry.

While potatoes are grown on a great variety of soils, loose friable soils are best suited to the crop and of these a strong sandy loam is preferable. Many make a mistake by trying to grow a crop on a soil that is not congenial to it, but by proper handling many soils that are not termed potato soils can be made to produce profitable crops. The best results can be expected from a crop on sandy loam following a clover sod. Potatoes are very prompt to respond to manures and chemical fertilizers, but in some cases due to peculiar soil conditions, not much satisfaction is received by using chemicals. It is often best to apply the manure to a preceding crop, as corn, and then follow with potatoes.

The ground should be well plowed

and fitted before the seed is planted as it then can be much more economically worked.

The introduction of modern potato machinery, partly due to the scarcity of farm laborers, has made it possible for the farmer to grow a large acreage of potatoes with a small amount of hand labor; and yet, those who grow but a small acreage, who for this reason can not take advantage of the machinery, need not feel handicapped, as the expense of growing the crop is not always materially reduced by the use of machinery.

The selection of seed is one of the most important points. No matter what the subsequent care may be, if good seed is not planted, the best results can not be expected. Be sure to use seed from good vigorous stock, from fields that showed excellent vigor and vitality. If the crop is grown for market, select a variety that is productive and of good quality; if for seed, varieties that your trade demands.

While it is usually best to plant good sized potatoes, small ones can often be used without detriment to the crop. Small sized potatoes from vigorous stock are preferable to large ones from stock that is weak.

If the seed is infested with scab or the soil on which it is to be planted is likely to produce scabby potatoes, the seed should be treated for scab.

It has not been long since the seed was nearly all planted by hand, but now the modern planter, which furrows, drops, and covers the seed at one operation enters largely into the planting of the crop. If the planter is used, be sure that it does accurate work. The loss of a few plants on an acre might more than pay the difference between a good and a poor machine.

Some people object to using a planter since in that case they cannot cultivate the crop crosswise; but with the use of a harrow or weeder at the proper time the weeds can usually be kept in check. If a weeder, spike tooth or slant tooth harrow, is run over the field several times before the young plants appear, the young weeds can be destroyed, and but little trouble later is likely to be experienced with weeds. If there is grass in the field which the weeder or harrow will not destroy, the grass can be checked by covering the rows and young potato plants just as they break through the ground with an inch or two of dirt, with but little, if any, detriment to the potatoes.

Cultivation should begin as soon as the rows can be followed. Let the soil be worked to a depth of at least four inches at first and shallower later. Keep the soil well stirred, as it helps to make plant food available and conserves the moisture. If many acres of potatoes are grown the two horse riding cultivator is an economical tool to own, since more and better work can be done with it than with the one horse walking cultivator.

The writer recalls with how much care potatoes were "hilled" and "laid by" a few years ago. Today it is accepted that level or nearly level culture and a moist soil mulch give the potato the best chance to develop.

The depredations of "bugs" and blight on potatoes are a boon for those who take advantage of the means for preventing them, which the science of agriculture has placed at hand.

If one were told that seven hundred per cent. had been realized on a legitimate investment the statement would be questioned, but that has been the average per cent. of profit realized by using Bordeaux on potatoes during the last three years, which the following figures show:

Year.	Increase per acre	Price	Value	Profit
1903	62 bu.	40c	$24.80	$20.80
1904	66 bu.	40c	26.40	22.40
1905	80 bu.	60c	48.00	44.00

Average profit for three years $28.73 or over 700 per cent. on an investment of $4.00. While as good results cannot be expected every season, experiments have shown that even in years when blight is not very prevalent ,the benefit from the use of Bordeau will be sufficient to pay the expense. There are cases where the profits have been greater than cited above.

(Concluded on page 104)

The Cornell Countryman

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JANUARY, 1906

The Winter-Course Students

AS THE January number of *The Countryman* is sent out, the 1906 winter-course students will be arriving from all parts of the state to spend a few months at Cornell. The members of the Agricultural College, both faculty and students welcome the winter-course class of 1906 most heartily and sincerely hope that your short stay may be a pleasant and a profitable one.

It is not expected that the winter-course student is going to learn all of the principles and methods of agriculture in eleven weeks; the regular student does not do that in four years. The course is largely designed to give the teacher an opportunity to start the student thinking along the right lines, and to teach him where and how to get the information he needs. Another way in which an agricultural education is useful to the farmer is in awakening him to the possibilities of his own position,—to give him a better knowledge of the varied opportunities in farming.

The man who has had the privilege to study agriculture at Cornell should not only become one of the leaders in the best methods of tilling the soil, but also should feel the importance of taking an active part in the social life of his community. In order to fit one's self for these duties, merely to go to the regular class lectures and recitations while here is not enough. Join your class organization, and take part in its activities whenever and in whatever way you can. Come to the general agricultural meetings, and become acquainted with the professors and with the other students. One of the things you will prize most after you leave the University will be the friendship of your teachers and of your fellow-students from all parts of the state and country. Make it an object to put aside your books and give up all work one or two evenings a week, and go to some lecture, musical entertainment, or social gathering, where you can get broader ideas and higher ideals than would come to you if you merely followed a regular routine. If you become a little homesick or discouraged with your work, be all the more anxious to leave your books for a time to get out and shake hands with others who perhaps have felt more or less the same way. You will go back to your work with an interest and enthusiasm that will make it seem much easier and pleasanter. Whenever you are in any difficulty over your work, or anything else, do not hesitate to talk with your professor about it. The students and faculty of the Agricultural College have come to have a great deal of respect and regard for the winter-course men, and are anxious to help you to get the best results from your short stay among us.

Secretary Wilson's Report

THE Report of the Secretary of Agriculture for the year 1905 should be encouraging to the American farmer, and should stimu-

late him to greater effort in Agricultural production. The general farm production for 1905 has exceeded that of any previous year, notwithstanding the partial failure of two or three second class crops; and this unprecedented production has increased the value of farm lands far above that of any previous year.

In importance of farm crops corn heads the list with a production of 2,708,000,000 bushels and worth $1,216,000,000. This is a gain in production of 42,000,000 bushels over the next lower year, and a gain in value of $128,000,000.

Hay is second in value. Although the production was not as large as in some previous years, the high price has given it a value of $605,000,000. This is $34,000,000 higher than the next lower year, that of 1903.

Next comes cotton. All of the data for this crop has not yet been received, but the value of the crop is somewhere near $75,000,000.

The wheat crop, which stands fourth, is second in size to that ever produced in this country. The yield was 684,000,000 bushels valued at $525,000,000, which is $11,000,000 over the big yield of 1891.

Oats are fifth in order of value with a yield of 939,000,000 bushels, value $282,000,000. This is 50,000,000 bushels and $22,000,000 under the crop of 1902.

The potato crop was in part a failure. Its value is $138,000,000, which is only $13,000,000 behind the crop of 1903.

Barley increased somewhat in production on account of the high price during the past few years. It yielded 133,000,000 bushels, valued at $58,000,000. This is 7,000,000 bushels and $4,000,000 under the highest crop produced heretofore.

Tobacco, like potatoes, is also a partial failure, yet because of the high price, it nearly exceeds in value the crop of 1899. All returns have not been received but $52,000,000 is thought to be a low estimate.

Sugar cane and sugar beets are classed together and are valued at $50,000,000.

The rice crop yielded 637,000,000 pounds. This crop is second in size ever produced in the United States.

Summing up the production and value of the different crops, only corn reached its highest production this year. But corn, hay, wheat and rice, reached this year their highest market value.

The total production of the cereals, including rice is 4,521,000,000 bushels, with a farm value of $2,123,000,000 or $145,000,000 over last year.

Live stock products have increased in both production and value. Dairy products are valued at $665,000,000, which is $54,000,000 above 1904. Poultry and poultry products have also made a large increase.

The report for live stock is favorable in the extreme. Despite the competition of bicycles, automobiles and trolley cars, the horse continues to increase, now numbering on farms 17,570,000, and valued at $1,200,000,000. Mules are worth $252,000,000.

Milch cows continue to increase, numbering 17,570,000, with a value of $482,000,000. Other cattle have decreased as have also sheep and swine.

A review of farm products show the value of things produced on farms to be $6,415,000,000. Animals have increased in value since 1900 $2,490,000,000.

The Department of Agriculture has and is doing everything in its power to aid the farmer. Plant and animal diseases have been investigated and in a majority of cases a remedy for them has been found. The different kinds of soil have been tested and their crop adaptability proven. In short every branch of agriculture has been given its share of time and attention, and the results of this good work is seen in the enormous increase of farm values and farm products.

In short every branch of agriculture has been given its share of time and attention, and the results of this good work is seen in the enormous increase of farm values and farm products.

How the Department regards the work already done and that to be accomplished is well shown in the following quotation from the Report:

"Great as has been the work undertaken and accomplished, gratifying as have been the results as shown by the Report, be it remembered that we are still at the threshold of agricultural development, and that the educational work, which has led to such grand results, has only been extended as yet to a portion of our population. There is not an intelligent, patriotic citizen in the United States, who will not say, 'Let the good work go on.'"

GENERAL AGRICULTURAL NEWS

Mr. Henry Wade who is secretary of the Canadian Horse Breeder's Association, is about to start a register for Thoroughbred Trotting and Pacing Horses.

Mr. Wade is starting this book at the earnest solicitation of the Canadian Live Stock Commissioner. This book is intended for a register only and not a stud book.

* * *

"Some of the animals of the Branch Experimental Farm herd at Nappan, N. S., are afflicted with tuberculosis. Instead of slaughtering the diseased animals, Dr. Rutherford, Dominion Veterinarian, has decided to segregate the herd under conditions such as favor the eradication of tuberculosis from the human system. The effects of the proximity of the diseased stock to sound animals will be tested from time to time, as well as the gradual improvement in the former which is expected to result from being stalled in quarters fitted up on the most improved hygienic principles. The interesting part of the experiment will be the application of the cold air treatment to consumptive cattle. It has been tried on the human system with considerable success: its effect on lower animals will be watched with interest."—*Farming World.*

* * *

"The big farm barn at the Massachusetts Agricultural College burned to the ground on the morning of Nov. 17, the fire being seen first about midnight. The building was well gone before the fire was discovered, so that there was no chance to save it. About 60 milch cows were saved with the sheep. About 60 hogs were burned together with 38 bulls and young stock. The machinery and 225 tons of hay were a total loss. Incendiarism is suspected, there having been other dairy barns burned in this town in the same week. There was some insurance but not much, it not being the policy of the state to insure public buildings."—*The Country Gentleman.*

* * *

At the meeting of the American Association of Farmers Institutes recently held in Washington, Mr. G. C. Creelman, President of the Ontario Agricultural College, was elected president. Mr. Creelman has been secretary of this association for a number of years.

The Irish Homestead gives an account of an interesting experiment carried on at the Hohenheim Agricultural Experiment Station by Herr Gusten Fingerling, to test the effects of condiments upon dairy animals. The experiment was divided into two parts, (1) To test influences on amount of food consumption, milk secretion, and digestibility; and (2) The food value of condiments when combined with other foods.

The results were that where poor food was used condiments were a benefit, more food being consumed and better results being obtained. In cases where a perfect nutritive ratio was fed, condiments did not increase the amount eaten or increase its digestibility.

* * *

The variety of wheat known as Macaroni Spring wheat has shown itself so well adapted to the soil and climate of Kansas, that the Kansas State Agricultural College is endeavoring to change it to a winter variety. Great success has thus far attended the efforts of the College, the sowing of last year producing 42½ bushels per acre. This year's sowing will complete the third trial, and it is hoped will be a big step toward the end in view.

* * *

The U. S. Department of Agriculture is working in co-operation with the Colorado Agricultural Experiment Station in breeding a pure breed of American Horses. The type it is expected will be as distinct as any which we have at the present time. For the basis of this experiment the American trotting horse has been taken, and it is hoped to get a good roadster and general purpose horse. It is expected that the work will take at least 15 years. Prof. W. L. Carlyle, who was formerly of the Wisconsin Experiment Station, is in charge of the experiment.

* * *

During the past year the corn root worm has wrought great havoc in Nebraska, whole crops in many cases being destroyed by this pest. Authorities say that the only way to destroy this pest is by a series of crop rotations.

* * *

"Japan promises to be a good customer for the horses of the United States. Several shipments of horses have already been taken to that country and the prospects for a greater trade in this branch of the breeding industry between the two countries are so bright that even the daily press is beginning to take notice of them. *The Boston Globe* recently referred to the prospective demand for American horses on the part of Japan as follows:

" 'The Consular reports of the department of Commerce and Labor are furnishing valuable information concerning American opportunities for trade in other countries. They are pointing out that Japan in peace is a fruitful field for American enterprise. Not only may American machinery find there a good market, but American breeders of horses have an opportunity to do a profitable business in Japan.

The Japanese horse is an undersized animal weighing not over 900 or 1,000 pounds, and standing under 14 hands high. He is entirely inadequate to the demands made upon him. During the war all serviceable horses were commandeered by the authorities and today there is a widespread demand all over Japan for good horses.

The Japanese government is anxious to get a good supply of horses and many of the best horses purchased for the army have been distributed by the government for stud purposes. It will be a long time, however, before the demand is even temporarily filled in Japan for horses as good as those which America can supply.

In getting a foundation for horse breeding, Japan shows the same disposition to begin with the best that can be obtained, that has characterized her efforts in other directions. Representatives have been sent to the different countries to see for themselves the horses raised in each, and it is a distinct compliment to the breeders of the

United States that this country was the one selected to draw on for foundation stock. It may be noted too, that the greater part of the horses purchased in this country by the Japanese have been trotting horses. They have bought some thoroughbreds to use in the building up of cavalry horses, but as the general purpose horse, it seems evident that the trotting-bred horse will take the same prominence in Japan that it has in this country.' "—*Horse World.*

* * *

In *Gardenflora* of September 1st, 1905, there was an article by Dr. L. Wittmark, which describes a new kind of edible wild potato, found in South America. Professor Fleckel has grown them in his garden at Marseille since 1896, and the improvement in both flavor and size has been very marked. Originally the taste of this potato was very bitter but since it has been cultivated nearly all of the bitter flavor has disappeared and there has been a large increase in starch content. In five years time the weight has increased from 29 grams to 100 grams and some have even reached 400 grams in weight. The flesh is a yellowish white, purple or greenish white. When seen growing in the field this new potato would be taken for our ordinary potato. If after harvesting the crop the runners are planted, a potato resembling our early potato results. This new variety will probably not take the place of our ordinary potato, but since it likes wet soil, it may cross well with our potato where it is necessary to plant on damp ground.

CORNELL NEWS

CAMPUS NOTES

The department of Animal Husbandry has bought two cows and one heifer from J. K. Innes of Randall Centre, Pa. These animals are of the dairy type of Shorthorn. There are only a few large herds of the dairy Shorthorn in this country, the beef type predominating.

* * *

Several of the students in the College have been agitating the question of a "Traveling Summer School of Agriculture," to be carried on during the summer of 1906. The object of the school is to give such students as may care to join it, an opportunity to travel over the more important agricultural centres of this country and to make a study of field and orchard crops, animal husbandry, and the manufacture and utilization of plant and animal products. The course is intended to cover not less than six weeks, and if established, will be carried on under the direction of an instructor appointed by the College. The total expense is estimated at $300 to $400 per man. This plan was presented to the faculty by the students interested, and has been referred to a committee for investigation.

* * *

During the coming winter, there will be a number of interesting lectures given. Among those who have promised to speak to the students of the College, are the following: President Gunnison, of St. Lawrence University; Director F. E. Dawley, of the State Farmers' Institutes; H. E. Cook; Mr. Fred Shepard, lecturer of the State Grange.

* * *

Nature Study work in the public schools is progressing finely along the line of school gardens. Frank Cornell has given a lot on Cayuga street for this purpose, and Supt. Boynton has given permission for the use of school grounds wherever possible. The class in Outdoor Art is to lay out these gardens, and the school children are to do the actual planting and care for the gardens. Part of the plan is to have the children display and sell the products of their own gardens.

One hundred and eight students are registered in Soils 1, an increase of 10 over last year. The laboratory is equipped in a much better way this year. There are 150 samples of soil from all parts of the United States. mounted in cases. The mechanical analysis centrifuge is in operation. Special studies are being carried on concerning the temperature, moisture, etc., of soils. Manurial requirements of all soils are also being studied by the new basket method.

* * *

Most of the professors are very busy now with Institute work. They hope to finish this work up before January so that they can devote all their spare time to the Short Course students.

* * *

At a recent meeting of the Poultry Association, the following officers were elected for the ensuing year: President, H. F. Prince; vice-president, F. G. Thayer; secretary-treasurer, C. E. Martin; supt. of show, L. B. Gable.

* * *

Several business men and a few ladies have registered for the winter course in Horticulture which is to be given this year. They expect to get some information which will be of practical value to them when they go back.

* * *

At the meeting of the Agronomy and Soils Seminary on Dec. 6th, Mr. Brown of the U. S. Bureau of Soils explained the wire-basket method of soil study and gave a brief account of the experiments being carried on here.

* * *

The 29th annual convention of the New York State Dairymen's Association was held in Binghamton on Dec. 12, 13, 14 and 15. Director Bailey spoke on "The Current Ideas of Education for Country Life." Prof. Pearson also spoke, his subject being "Sanitary Milk for Butter and Cheese."

This year the Winter Courses have branched out in a new direction. A course for women, in Home Economics, has been started and will run the same length of time as the other short courses. Housekeeping, domestic science and economy are to be covered in lectures and demonstrations. Following is a list of the women who will aid in instruction: Mrs. Ellen H. Richards, Boston Institute of Technology; Dean Marion Talbott, of Chicago University; Mrs. Alice P. Norton, of the University of Chicago; Mrs. James Hughes, Toronto, Can.; Miss Isabel Bevier, University of Illinois; Miss Abby L. Marlatt, Providence, R. I.; Miss S. M. Elliott, Simmons College; Miss Anna Barrows, Boston; Miss Helen Kinne, N. Y.; and a number of others.

* * *

The Lazy Club is in a flourishing condition this year. The first meeting was held on Sept. 25, with a discussion of "The Fruit and Vegetable Exhibit at the New York State Fair," by Mr. C. S. Wilson. Mr. Novik spoke on "Chicago Parks," and Mr. Hosford described Hale's Connecticut peach farm.

Nov. 6 was "Chrysanthemum night," and Mr. Hunn was in charge. Mr. Bayer and Mr. Wilcox spoke on different phases of the subject. There was a fine display of 'mums at the club room, furnished by Mr. Bayer of Toledo, and by several Buffalo florists. Mr. John Rudy of Elmira sent several large blossoms, one of which was 12 inches in diameter.

On Nov. 13, Mr. Warren H. Manning, a Boston landscape architect, spoke on the "Jamestown Exhibition."

Mr. De and Mr. Ghose told about "Fruit and agricultural products of Bengal, India, on Nov. 27.

Oct. 23 and Nov. 6 were nights of banner attendance, having 54 and 49 respectively.

All are welcome to these meetings which are held at 7:30 every Monday night at the Forcing Houses.

THE STATE COLLEGE OF AGRICULTURE AT CORNELL

The above cut represents the new buildings of the College of Agriculture as they will look when completed. The agricultural buildings are situated at the extreme north-east part of the Campus. They occupy a site which is higher than any other part of the University grounds, and will command a view of the country around in all directions.

On the left of the picture is the Hall of Agronomy, 51 feet front by 109 feet deep. In the center is the main building, which will contain lecture rooms, laboratories, and offices; it has a front of 145 feet and a depth of 100 feet. To the right is the dairy building, which, including the extension for cheese and butter laboratories, has a front of 163 feet, and a depth in the main part of 60 feet. The group is connected by arcades.

Work on the buildings is still in progress. The walls of the main part of the dairy building are now completed up to the second floor, and the extension is roofed over. Little progress has been made upon the other buildings since last report, because of the effort which was unsuccessful, to complete the dairy building in time for the winter course students.

FORMER STUDENTS

'88, B. S. A.—After graduating from the College of Agriculture at Cornell University, Mr. G. D. Brill, upon the advice of Professor Roberts, returned to his home at Poughquag, N. Y., to test on the farm what he had learned in the school.

G. D. BRILL, '88

After several years farming he returned to Cornell in 1897 to take some advanced work in horticulture. While he was at the university, President Schurman received a letter from China asking that a man be recommended to introduce American machinery and methods of agriculture there. Mr. Brill was recommended for the position by Professor Roberts and after some correspondence, and on condition that he might have an American assistant of his own selection, he went to Wuchang to begin work under Chang Chi Tung, Viceroy of the Central China provinces. The next year he was joined by Mr. J. W. Gilmore with tools, plants and seeds. Together they established the first agricultural school in China with sixty students.

After the Empress Dowager dethroned the Emperor and seized the reins of government, a reaction against reforms set in and both resigned; Mr. Gilmore to return to America, and Mr. Brill to collect plants and seeds for the United States Department of Agriculture. While in the Philippines he made some reports to Dr. F. W. Atkinson on the agricultural conditions there and was tendered a position by him to establish an agricultural college in the Islands. Mr. Brill first returned to the United States and was married to Miss Mary Williams, who had been a Special student in Agriculture at Cornell, then returned to the Philippines for a year, but resigned and left at the time Dr. Atkinson did. After spending some time in China, Palestine and Europe, he returned to farming at his old home.

Last spring he sold out to his brother and went to the Adirondacks to take charge of several thousand acres of land for the Lake Placid Club. He has recently come to Cornell to assist in the Winter-Course in General Agriculture.

Mr. Brill's office in the College of Agriculture is largely as administrator and also counselor of the men who take the Winter-Course in General Agriculture. He will attend to the correspondence and registration, will have in charge the co-ordination of schedules, and will advise the students in regard to any matters on which they need help; he will aid them in their organizations, and, in general, be an adviser and guide. There is need of co-ordinating the social and other activities of all the Winter-Course students in all the courses. He will also give instruction.

* * *

'05, W.—E. E. Barnum of Albion, N. Y., has returned to Cornell to take the four-year course.

'05, W.—R. J. Brooks is on the home farm at Cortland, N. Y., putting into practice some of the ideas he learned here at Cornell. He says that the course was many times worth the effort, besides the many acquaintances made here.

'05, W.—E. L. Chapman writes us that he is on his father's fruit and grain farm at Albion, N. Y. The course here is making his work much more interesting.

'05, W.—A. L. Cook feels well repaid for the time spent here last winter. His advice is that every young man with an inclination towards agriculture should, at least, take a short-course at Cornell. At present he is on the Riverlawn Farm, Cincinnatus, N. Y.

'05, W.—James B. Covill of Victor, N. Y., is going to return to us this winter to take up more advanced work.

'05 W.—Dewitt G. Crowell is a member of the firm of Crowell Bros. They are running a large farm at Wallkill, N. Y. Their specialty is fruit and potatoes, and also have a herd of thoroughbred Holstein cows. They find that scientific agriculture is profitatble.

'05, W.—C. D. Davis spent a short time at the Winter's Farm, Smithboro, N. Y., after which he returned to his father's farm at New Berlin, N. Y.

'05, W.—H. A. Dean is at present working for his father at Ithaca, N. Y.

'05, W.—Clarence H. Diggs is growing potatoes on the home farm at Elba, N. Y. He says that no money value can be placed on the knowledge and friendships gained here last winter.

'05, W.—William J. Faulkner of Hornellsville, N. Y., writes that spraying is financially a success. He has also gained an interest in improving the strain of Holstein cattle in his district.

'05, W.—G. G. Grannis contributes his support to *The Countryman* from Clinton, N. Y., where he is employed in a grocery and drug store.

'05, W.—Clifford E. Greene is on the home farm at McDonnaugh, N. Y. They have 125 acres in all. The stock consists of registered Guernseys, high-grade Jersey cattle, and O. I. C. swine.

'05, W.—Floyd D. Harrington is helping his father on a dairy farm at McDonnaugh, N. Y. He wishes well for all his classmates.

'05, W.—F. Helfer, of Naples, N. Y. says that it pays to spray especially with grapes. Owing to this advantage from his course here he wishes to return and pursue further work.

'05, W.—H. H. Herriman, of Syracuse, N. Y., has written us that he is coming back this winter to take the Poultry Course. Already he has gained a financial benefit from his last course by the increased value by drainage of 22 acres of swale land. His acquaintances made here are extremely valuable to him and he himself wishes that every city man, who contemplates taking up any branch of agricultural work, should take at least a short course at Cornell.

'05, W.—Jesse C. Irwin is superintendent of the farm belonging to the Crowell Bros., at Walkill, N. Y. The success on this far mthat has come from the use of scientific methods has had its effect on the community. Mr. Irwin and Mr. Crowell have persuaded several other young men of their neighborhood to take the Winter-course this year. Mr. Irwin expects to return for more work himself in the near future.

'05, W.—Stephen L. Merritt is at present practicing mixed farming at Akron, N. Y.

'05, W.—W. H. Miller, of Newark, N. Y., is now registered in the two-year special course.

'05, W.—Howard A. Olin has changed his address to Perry, N. Y., where he will run a large farm in co-operation with his father.

'05, W.—H. B. Patten has settled down to till a 150-acre farm at Albany, N. Y. He certainly is following the teachings of Cornell, for he is at present repairing his farm buildings.

'05, W.—Walter G. Phillips is making use of the knowledge acquired here, at East Bloomfield, N. Y. He is carrying on general farming on a 240-acre farm and in the midst of his successes, he says that he will never forget the many pleasant memories of Cornell.

'05, W.—Claude E. Purdy is on the Tarbell Farms at Smithville, N. Y.

This farm is the property of Mr. Gage E. Tarbell of the Equitable Life Insurance Co. We consider Mr. Purdy very fortunate in his position as assistant herdsman. He says that this is partially due to his short stay here.

'05, W.—E. N. Reed, of Cortland, N. Y., tells us that his prospects in the farming line are very bright. His neighbors are impatiently waiting to see the outcome of the practicing of the ideas gained at Cornell.

'05, W.—F. A. Salisbury is carrying out some of the ideas of practical agriculture, on a fruit and vegetable farm at Phelps, N. Y. He is taking an active interest in the Grange of his section, holding several important offices.

'05, W.—Milo J. Shaw has found spraying very beneficial on his father's farm. The short Winter Course has helped him to realize the beauty and the value of country life to such an extent that he "wished a little Moore (Miss Mable Avis M.), and employed a preacher on the 6th of December last." Mr. and Mrs. Shaw will be at home, Kendall, N. Y., after New Year's to all their friends.

'05, W.—Milton B. Sisson is on the home farm at Almond, N. Y. He is especially interested in the breeding of Guernsey cattle and fancy poultry.

'05, W.—Raymond Watson is on a general agricultural farm at Lockport, N. Y. He is especially interested in dairying and poultry, although fruit and vegetable growing occupy some of his time.

'05, W.—R. D. Woolsey, the president of the Fletcher club, '05, is at present, dairy superintendent at the Tully farms, Syracuse, N. Y. Their plant is adapted to accommodate about 500 cows, but at present the dairy consists of only about 200 cows. They are shipping certified milk of a high grade. They have a number of the 1905 short course students in their employment. These are Harry Walker, dairy course; Elmer Phillips, poultry course; and John Ford and C. W. Thompson of the general agricultural course.

'84, B. S. A.—The November issue of *The Countryman* contained a notice of the nomination of Charles Fred Boshart, of Lowville, N. Y., for assemblyman from that district. By a recent number of the *Lowville Journal and Republican*, we learn that he was elected to the office by a majority of 1,107; without solicitation he carried his own town by a far larger majority than any other candidate for the same office had ever received.

Mr. Boshart was born Sept. 17, 1860, on the farm where his grandfather had settled over a century ago. With the exception of four years

C. FRED BOSHART, '84

at Cornell, during which time he was a pupil of Prof. I. P. Roberts, Mr. Boshart has been connected with his father in farming in one of the richest dairy districts of the state. He is going to Albany to represent the people of his district, regardless of political considerations, and in the interest of wise and wholesome legislation. His work in the legislature will be chiefly in the interest of the dairy farmer, the breeder, and the agriculturist, for which work his past life and experience has well fitted him.

'05,W.—Some of the short course boys of last winter are inclined toward a political life. Gerry H. Wilcox of Villenova, N. Y., after much urging, accepted the nomination for Justice of the Peace, and was elected by a splendid majority over several candidates of greater age than himself. In spite of this condition of affairs, his ambition is to some day control a strictly up-to-date farm on modern scientific lines.

BOOK REVIEW

AGRICULTURE THROUGH THE LABORATORY AND SCHOOL GARDEN. By C. R. Jackson and Mrs. L. S. Daughtery, State Normal School, Kirksville, Mo. Illustrated, 5½ x 8 inches, 402 pages, cloth. Orange, Judd Company, New York. Price $1.50, net.

This book was primarily prepared to meet the needs of the teacher of agriculture in the schools, but is equally valuable for anyone who desires to obtain a general knowledge of elementary agriculture. The style is easy and pleasing, the type is large and clear, the paper is good and it is, moreover, profusely illustrated with halftones and wood cuts which not only supplement and enforce the text but render the book very attractive.

The authors begin with the nature and formation of soils, discussing very fully the factors of soil formation. From this they very logically pass to the different kinds of soils and their physical properties, to soil moisture, and the relation of soil moisture to plant life. The preparation of the soil for plants leads up to a discussion of the soil as related to plant life, in which the uses of the soil to plants, the constituents of plants, and the fertility of the soil are clearly and concisely discussed.

Under leguminous plants, is included the action of these plants as nitrogen gatherers and soil renovators, and their value as food. From this follows the principles of feeding, under which the different kinds of food are taken up; a comparison of nitrogenous and carbonaceous foods; the analysis of feeding stuffs; balanced rations and the rotation of crops.

In the chapter upon milk, special attention is given to the care of milk, simple explanations being given of the causes of bad milk, and directions by which bacteria and abnormal odors can be kept out of the milk.

Methods of separating and ripening cream, of testing, of churning and caring for the butter, are taken up briefly but clearly, each process being carefully illustrated and explained.

From the consideration of the dairy the authors turn again to plants, and take up the question of propagation by means of seeds, and buds. Cuttings, budding, grafting, and layering are each explained and the method illustrated by figures. From the propagation of plants they pass to the closely related topic of improvement of plants, first the improvement of existing types and secondly the securing of new varieties.

The last chapter is devoted to the ornamentation of the home and school grounds. The treatment of landscape gardening contains an exposition of the formal and the natural style with a marked preference for the natural style.

The subject matter in the book has been compiled from the leading authorities and at the end of every topic is a reference list of the latest and best works upon that subject.

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(Continued from page 91)

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The sorter, or rather the grader, also facilitates handling, as the tubers can be shoveled onto this machine, which removes the small ones and at the same time gives the operator an opportunity to pick out rough or decayed potatoes. By sacking the potatoes in the cellar, and many dealers prefer to handle them this way rather than in bulk, some time is gained in handling them at the shipping point.

Marketing the crop gives the farmer an opportunity to exercise his judgment. The crop can often be held for a rise in value with profit, but not always.

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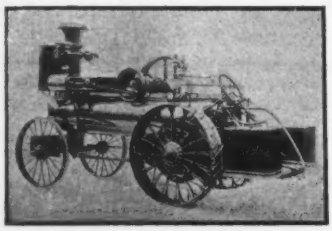

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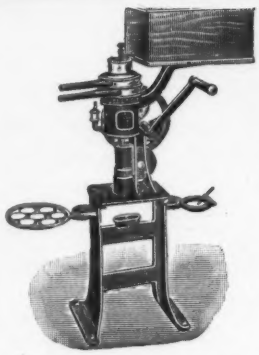

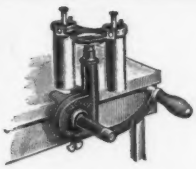

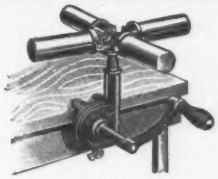

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